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# SCIENCE NEWS LETTER

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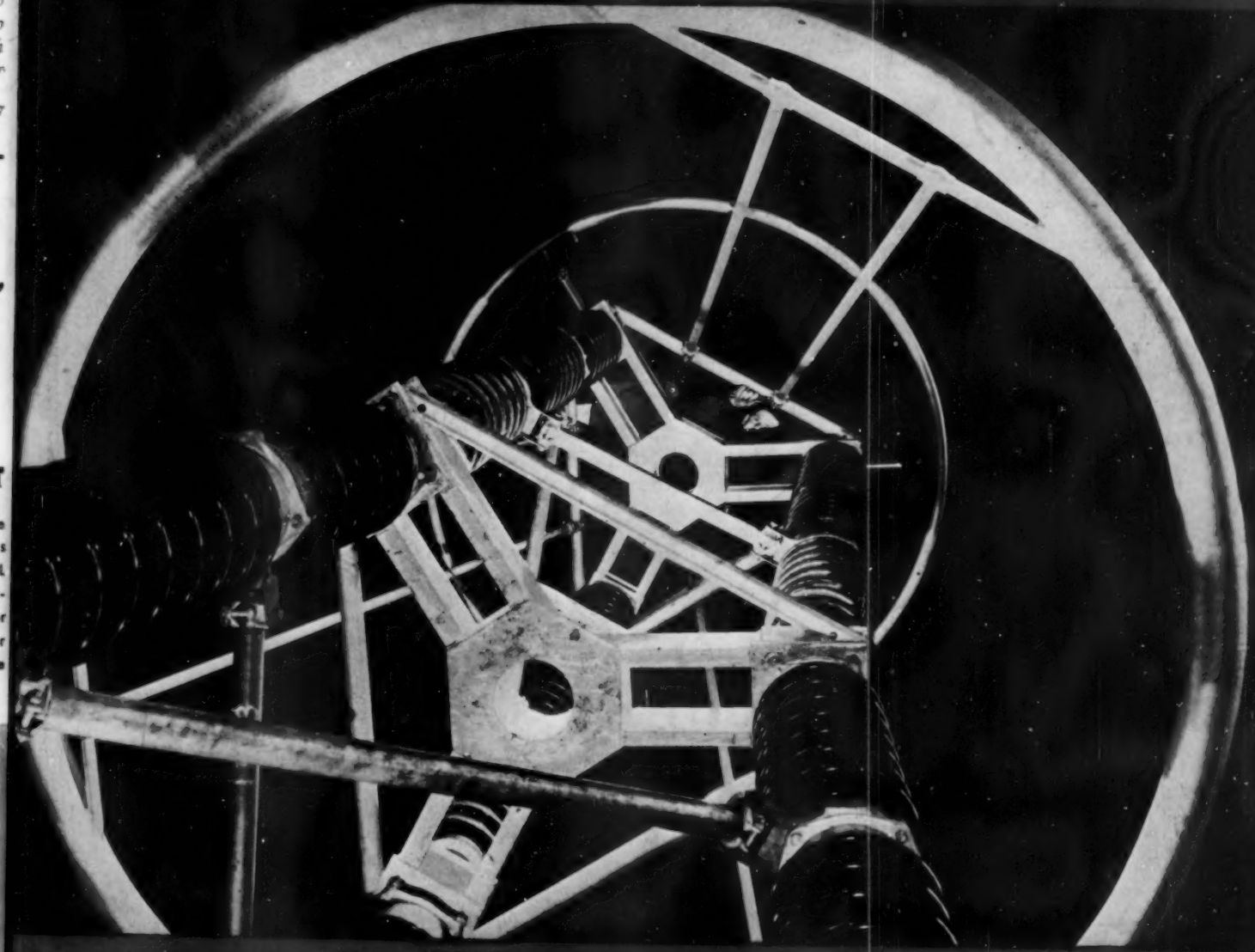

**Taming the Elements**

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A SCIENCE SERVICE PUBLICATION

GENERAL SCIENCE

# Science Under Controversy

**Behind the scenes at the UNESCO meeting scientific work appears to be criticized and viewed with skepticism. No scientists in basic education conference.**

By WATSON DAVIS

*From Mexico City*

➤ SCIENCE is getting a big hand in public at the UNESCO conference in Mexico City, but behind the scenes some stiff punches are being landed by the administrators, the mass media enthusiasts and others a bit afraid of the scientists.

President Miguel Aleman of Mexico told the delegates: "The task before UNESCO is to promote science and to find ways and means whereby all nations shall share the benefits and collaborate in its development, under condition that culture preside over those benefits and that collaboration. For this, education is indispensable, both in the sense of instruction and in its higher meaning of moral guidance."

This keynoting by the Mexican president arises out of an extensive effort to put facts and knowledge at the service of a people still in a relatively primitive culture.

Dr. Julian Huxley, UNESCO director-general, and Dr. Joseph Needham, sciences chief, both leading British scientists, have set in motion projects that will both increase knowledge and spread knowledge of what is known.

There is a project to explore and bring under control one of the last big geographic unknowns, the Amazon River basin that touches on seven countries. This would be a practical demonstration whose way of doing could be applied elsewhere, affecting people, resources and trade with all the world. Yet in the U. S. delegation there is a feeling that this may be too much of an operation for UNESCO to undertake.

For a week, basic or fundamental education—the way of getting a minimum knowledge to all—has been a special conference topic. Yet no scientists have sat in on this great prospective undertaking, although science even to the most elementary class is surely basic.

UNESCO has in the past year given courage and financial support to 14 international science bodies, allowing them to do projects and make world plans. This is the first time a world governmental body has done such an obvious, practical thing. Yet there may be criticism of this action.

The Paris office of UNESCO has acted as a clearing house for scientists who want to find out what is happening elsewhere or want to join in international projects. And a start has been made in establishing regional offices for science—in Brazil, China, India and Egypt. This liaison work seems to have drawn little criticism.

To war-devastated sections of the world, UNESCO scientists have sent apparatus and books. One effective operation was the purchase of small machine shops and tool sets from war surplus and the placing of them in universities and science centers that need them.

*Science News Letter, November 22, 1947*

GENETICS

## Some Hereditary Traits Passed on by Plasmagenes

➤ INHERITANCE of such characters as hair color and seed shape in animals and plants is not determined entirely by the invisible genes that are handed down strictly in or on the chromosomes in the cell nucleus, Prof. T. M. Sonneborn, Indiana University zoologist, declared in a lecture before the University of Missouri chapter of Sigma Xi, national science honor society. Some hereditary traits pass from one generation to another by means of what he calls plasmagenes, which are carried in the general protoplasm of the cell rather than in the highly specialized little nuclear rods and spheres.

Prof. Sonneborn first discovered plasmagenes in the lively microscopic animals of the group known as Paramecium, sometimes called "slipper animalcules" because of their shape. Most of the inherited characters in Paramecium are passed along from one generation to another in quite orthodox genetic fashion, in or on the chromosomes. But Prof. Sonneborn found that one exceedingly important character in some strains of the animal—its ability to produce a substance highly toxic to other strains—is transmitted entirely through something found only outside the nucleus and in the general body protoplasm. So he named these the plasmagenes.

One highly significant difference between plasmagenes and "regular" genes is that while the latter are rearranged and transmitted only in the process of sexual reproduction, in a manner predictable with mathematical exactness, plasmagenes do not depend on union of male and female elements for their realignments, and may be passed from parent to offspring without regard to Mendelian mathematics.

For the researches that led up to the discovery of the plasmagenes, Prof. Sonneborn was awarded the annual $1,000 prize of the American Association for the Advancement of Science.

*Science News Letter, November 22, 1947*

MEDICINE

# Subtilin Checks TB Germ

➤ EVIDENCE, believed conclusive, that subtilin, a new cousin of penicillin, inhibits the tuberculosis germ, has been reported by scientists in the University of California Medical School.

Dr. Hamilton H. Anderson, professor of pharmacology, and Sam C. Wong and Alvin S. Hambly, research associates, have completed studies of the antibiotic in different media.

Results indicate that the drug cannot be introduced into the body in sufficient amounts to kill the tuberculosis germ; but that concentrations can be obtained which will inhibit its growth.

Eventual use of subtilin in man is indicated by its low toxicity and marked inhibition of the tuberculosis germ, Dr. Anderson said.

While subtilin had been suggested previously as an agent against tuberculosis, experiments on its effectiveness had been previously inconclusive.

Dr. Hamilton did the research in collaboration with the Western Regional Research Laboratory, U. S. Department of Agriculture, Albany, Calif., and Dr. A. J. Salle, of the department of bacteriology on the Los Angeles campus of the University of California.

*Science News Letter, November 22, 1947*

PHYSICS-CHEMISTRY

# Nobel Prizes Awarded

**Honors in physics and chemistry were won by a pioneer investigator of the ionosphere and a chemist who worked on the synthesis of penicillin.**

➤ TWO leading British scientists, a pioneer in radio transmission and a chemist who worked on penicillin, have won the 1947 Nobel prizes in physics and chemistry.

The winners are Sir Edward V. Appleton, physicist and secretary of Britain's Department of Scientific and Industrial Research, and Sir Robert Robinson, Oxford University chemist. This year's other Nobel award in science was the prize in medicine and physiology, shared by the American husband-wife team of Carl F. and Gerty Cori of Washington University, St. Louis, and Dr. Bernard Houssay of Argentina. (*See SNL,* Nov. 1.)

Radio listeners throughout the world owe thanks to Sir Edward. His fundamental researches have contributed much to the clearness with which broadcasts from distant lands come through today.

A pioneer investigator of the ionosphere or "radio roof" surrounding the earth, Sir Edward proved by direct experiment the existence of the layer of ionized atoms 115 miles or so above the earth, present both day and night. This layer is the one that reflects shortwave radio waves at night.

The invisible reflecting layers of the ionosphere have been the subject of intensive research since their existence was proved. Today calculation of their height is important in determining the best frequencies to use in getting a broadcast through.

### High Frequency Waves

To determine their height, short pulses of high-frequency waves of different wavelengths are sent into the ionosphere. The time it takes the waves to go up and back is then determined. It is easy to tell how far a radio echo has traveled because the speed of radio waves is the same as light, which has been accurately calculated.

These layers change greatly from day to night, and from summer to winter. They are also greatly affected by activity on the sun. Changes in the layers, of course, in turn affect short-wave communication. When the layers are too thin, radio signals fail to be reflected and broadcasts are blacked out.

The puzzle of how strychnine, powerful poison, is put together is the latest research on which Sir Robert has been working. At the International Chemical Congress in London this past summer he reported finding a close relation between quinine, the anti-malaria remedy, and part of strychnine's molecular skeleton. Unfortunately, there is no prospect in his opinion, of making quinine from strychnine because the natural molecules produced in the plants yielding these chemicals are molded in different ways.

### Synthesis of Penicillin

During the war, Sir Robert and associates at Oxford worked on the synthesis of penicillin. Chemicals with penicillin activity were obtained almost simultaneously by the Oxford group and American scientists, but the amounts were so small as to cast some doubt at the time on whether or not penicillin had been synthesized.

The difficulty of obtaining synthetic penicillin in large enough amounts for medical use was explained by Sir Robert at the time he received the Franklin Medal of the Franklin Institute in Philadelphia last March as follows:

"Penicillin possesses a curious strained structure unique among natural products and this endows it with such reactivity that all the chemical processes tried (in synthesis) have so far proved too brutal. The molecule is of course stable enough to exist but it is easily thrown off its balance.

### Difficulties Involved

"A ball can rest on a narrow shelf but if that is narrow enough and high enough it might be possible to find that the attempt to throw the ball on the shelf, so that it would remain there, would succeed only once in a thousand times. It seems that our chemical processes are too energetic and we have no equivalent to the certain method of placing the ball on the shelf by hand."

Last year's first Nobel prizes in science since the war were swept by American scientists. Dr. P. W. Bridgman of Harvard won the physics award; Dr. J. B. Sumner of Cornell University won half of the prize in chemistry, with Drs. W. M. Stanley and J. K. Northrop of the Rockefeller Institute for Medical Research sharing the other half; and the medicine and physiology award was made to Dr. Hermann J. Muller of Indiana University.

*Science News Letter, November 22, 1947*

***NOBELISTS—Sir Robert Robinson, Oxford University chemist, and Sir Edward V. Appleton, physicist and secretary of Britain's Department of Scientific and Industrial Research, receive awards.***

PUBLIC HEALTH

# Longer Life Span Ahead

**Within the next 10 or 20 years the average person may live to be 70 or more with the development of new disease-fighters and wider application of present ones.**

➤ THE average length of life for the population of America should reach the biblical three score and 10 years within the next 10 or 20 years and may even go over the 70-year mark, statisticians of the Metropolitan Life Insurance Company predict.

The average life span in the United States has already reached 65.8 years. This is a gain of 16 years since the turn of the century. Expectation of lengthening the average life to 70 years or more is based on the probable development of new weapons to fight disease and wider application of present ones.

"It may well be," the statisticians speculate, "that medical science is now at the threshold of discoveries in the fields of cancer and of the degenerative diseases, which knowledge, when crystallized and applied may add significantly to the biblical three score and ten."

Pneumonia and influenza are rapidly becoming minor causes of death. They now rank eighth as cause of death among the company's industrial policyholders whereas 10 years ago they were outranked as killers only by heart disease and cancer. They now take less than four of every 100 who die, whereas 10 years ago pneumonia and influenza accounted for 10 out of every 100 deaths from all causes combined.

A new record low death rate for tuberculosis was established during the first nine months of the current year among the industrial policyholders. The death rate from this disease is already below 35 per 100,000 whereas 10 years ago it was about 50 per 100,000 and 20 years ago almost 100 per 100,000.

New record low deathrates were established so far this year for three of the four principal diseases of childhood, measles, scarlet fever and whooping cough, and for appendicitis.

The death rate from acute poliomyelitis declined sharply, reaching 0.4 per 100,000 although this is not a minimum.

Deaths from heart, blood vessel and kidney disease now make up about half the deaths from disease among the industrial policyholders and increased slightly over last year. Cancer, accounting for one-sixth of the total deaths, reached a new high mortality for this period of the year.

The increases in cancer and heart, blood vessel and kidney disease, it is pointed out, reflect in appreciable measure the change to older age in the population group studied.

Diabetes mortality dropped slightly. So did mortality from suicides and accidents. The mortality from home accidents was the lowest in our history and the motor vehicle fatality rate is the lowest for any peacetime year since 1922.

*Science News Letter, November 22, 1947*

NUTRITION

## Home Economics Students Eating On Dollar a Day

➤ WORRIED about the high cost of living? Six seniors in home economics at Cornell University and their instructor are eating on $1 a day or less per person.

Not in the least thin or emaciated, the co-eds are spending seven weeks of practical homemaking in a seven-room apartment in a college hall, and they are proving that well-planned, balanced and varied meals needn't be expensive.

In fact, one week's meals averaged 85 cents daily per person.

Meals are planned and prepared by a "cook" and "assistant cook," whose identity changes each week, and all marketing is done in local stores. The girls keep an eye out for "specials" and seasonal foods, and inexpensive meat cuts to help them keep within their budget. Marketing is done twice a week.

Far from frugal, a typical menu includes for breakfast: fruit juice, scrambled eggs, toast, jelly, milk or coffee. Lunch: Welch rabbit with bacon curls, lettuce and tomato salad, stewed apricots, cookies and milk. Dinner: Salmon loaf with egg sauce, snap beans, baked potatoes, shredded carrot and raisin salad, gingerbread with lemon sauce, and demi-tasse.

On Tuesdays when no meat is served, the girls substitute cheese dishes—fondue, souffle, toasted sandwiches, macaroni casserole, and vegetable plates. Luncheon sandwiches are sometimes open-faced to conserve bread.

The budget figure of $1 a day was set last spring, so now, as prices rise, the girls must be even more economical.

One week, the average daily cost for meals hit 91 cents, but included in the week was a dessert bridge for 16—nine guests were invited. Pineapple mousse, chocolate macaroons, vanilla wafers, and coffee were served, and the budget could be stretched to include home-made chocolate raisin clusters.

In addition to cooking duties, the girls also act as housekeeper, assistant, manager, and even "mother" to a 4-months-old baby.

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***WITH THE SPEED OF SOUND—This swordfish-like plane with its narrow sleek body and long lance-like pointed nose is the Navy Skyrocket. This winged V-2 has rocket power supplementing jet engine propulsion. It is a sister ship to the Skystreak which holds the world's official speed record.***

AERONAUTICS

# To Keep Pace with Sound

**Rocket and jet powered, the Navy's Skyrocket is expected to fly at approximately 760 miles an hour, 100 miles faster than its sister ship the Skystreak.**

➤ ROCKET power, supplementing jet engine propulsion, features the new Navy transonic Skyrocket plane revealed in El Segundo, Calif. It is a sister ship of the turbo-engined Douglas Skystreak, which now holds the world's official speed record of 650.8 miles an hour.

The new plane, dubbed a winged V-2, is designed to better this record by perhaps 100 miles, approaching the speed of sound, which is approximately 760 miles an hour at sealevel. It is a research craft, to gather information relative to problems encountered at those speeds.

The Skyrocket in appearance resembles a swordfish, with its narrow sleek body and long lance-like pointed nose. It is powered with a Westinghouse turbojet engine and with a rocket engine built by Reaction Motors, Inc. It can take off and cruise at high speeds with its ordinary jet propulsion, then sweep to higher speeds when the rocket engine is turned on. It is the first man-carrying flight machine to utilize a combination of jet and rocket energy.

To be known as the D-558-2 by the Navy, the new plane is radically different in appearances from the D-558 Skystreak, because of its needle-like nose, its slimly tapered fuselage resembling a winged V-2 rocket, and its stubby swept-back wings which give a total wingspan of only 25 feet. The body of the plane is about 45 feet long. The pilot's enclosure is entirely within the fuselage, with no "bubble" to increase air drag.

Built to withstand the extreme strains at the speed of sound, the body of the new plane is made chiefly of magnesium alloy. Wing and tail faces are largely the tough aluminum alloy known as 75s.

The Skyrocket is a joint undertaking of the Navy, National Advisory Committee for Aeronautics, and Douglas Aircraft. It will undergo a test-flight program at the Air Force Test Center, Muroc Dry Lake, Calif., and then be turned over by the Navy to the NACA.

*Science News Letter, November 22, 1947*

ASTRONOMY

## Galaxies Are Scattering Away from Each Other

➤ THE hundred-billion-odd galaxies, systems of stars like the Milky Way system of which the earth is a part, are flying away from each other so rapidly that eventually they may become lost in space. Cosmic repulsion or "negative gravitation" has set in so that clusters of billions of stars are scattering away from each other.

But the average density of matter throughout our planetary system and even throughout our galaxy, where stars are separated from each other by millions of light years, is so high that the tendency to scatter is overcome by the great gravitational forces involved. This view is stated by Dr. Harlow Shapley, director of Harvard Observatory, in the annual report of the Smithsonian Institution.

Even in a cluster of galaxies like the one in our vicinity—a cluster which includes our Milky Way galaxy, the Andromeda nebula and its companions, the Magellanic Clouds and half-a-dozen others—gravitation still controls the situation, Dr. Shapley states. Our cluster of galaxies is not dissolving under cosmic repulsion—at least not with marked rapidity. The cohesion that maintain our cluster apparently operates in a number of other close associations of galaxies. Their mean density is high enough for gravitational control.

But throughout the universe in general the mean density is perhaps only one-hundredth of that within the cluster of galaxies. It is too low for gravitation any longer to maintain the situation. The expansion that has set in under the repulsive force will still further lower the mean density. It therefore appears that we— the metagalaxy—are doomed to infinite dissipation.

At the same time that the earth is expanding, the heat of the stars is going out into cold space. The universe is steadily approaching a heat-death—a cold near absolute zero in an empty world.

We cannot be sure that the reverse building-up processes are not going on in some parts of the universe, Dr. Shapley points out. We see less than one percent of it. There is, however, no substantial evidence or argument for the cyclic restoration of heat and density. And some cosmogonists are bold enough to abstain from wishful thinking.

*Science News Letter, November 22, 1947*

AGRICULTURE

# Europe's Dire Food Needs

**Bad weather and disruption by the war of agricultural needs such as men, horses or tractors, seed and fertilizers, leave Europe on the brink of starvation.**

By DR. FRANK THONE

➤ EMERGENCY food needs in Europe have forced a special session of Congress, which neither President Truman nor the assembled statesmen wanted. Yet here they are, and even those who went to Europe with their minds made up against helping the people there are for the most now ready to vote aid, even in terms of billions.

In the meantime, many Americans who have not had a chance to see present conditions in Europe are demanding, "Why help them at all? Isn't it their own fault if they're hungry? What have their farmers been doing for the past two years, anyway?"

These are simple questions, assuming the possibility of simple answers. Unfortunately, the farm situation in Europe is anything but as simple as the questions assume, hence simple answers are not possible.

### Weather Woes

Simplest single factor, and the one most easily understood in this country because we ourselves had a taste of the same bitter medicine, was the wicked weather in 1947. For Europe, weather woes began with the fall of 1946, which ushered in the most bitterly cold, most violently windy, most burdensomely snowy winter in all the recorded history of the continent. Destructive floods over many fields in England, freezing of nearly half of France's winter wheat crop, are sample items from that winter's long tale of catastrophe.

The polar winter was followed by a Saharan summer. Drought destroyed much of what the cold had spared, just as drought scourged our own cornfields. Only in Europe the drought took toll of everything. In France, some of the winter-killed wheat had been replaced by spring-sown grain; drought struck this, too. Italy's wheat harvest dwindled before the scorching sun. In Germany, potatoes and fruits suffered along with grain crops.

But Europe's weather troubles came only as an added blow after all the scourgings of the world's most terrible war, like Job's curse of sore boils capping all his other losses and griefs. Even with a normal season, Europe would still be in deep trouble and needing help.

Most of this deep pit of trouble in which Europe is struggling was dug and blasted by the war. Agriculture has five great requirements, besides the basic land: it needs men, horses or tractors, implements, seed and fertilizer. The war killed men and horses or led them off into captivity, took for guns and shells the steel needed for tractors and plows, destroyed or ate up the seed, turned fertilizer chemicals into explosives and incendiaries. These violent dislocations cannot be set right in two years—hardly in 10.

### Shortage of Manpower

The first requirement for farming, manpower, is going to be short in Europe's principal agricultural areas for at least that long. The dead cannot come back, and the underfed young are not growing up into strong farm workers. Not all the German war prisoners have been repatriated: there are some in England and France and an unknown but probably much larger number in Russia. There are thousands of displaced persons in western Europe—Balts and Poles who fear to return to their former homes, Germans from Poland and the Sudetenland who could not return if they would. Those among them who are farmers have no fields to till where they are; the farms they once had are no longer part of the economy of western Europe. Finally, the farm-labor migrations that used to mark harvest-time—Poles into Germany, Italians into southern France—are stopped, at least for the present.

One other factor is not so much an actual lack of farm labor as lack of incentive to farmers. In France, farmers can sell their crops but can get nothing but money for them—they cannot buy anything they want with their money. So they either grow less grain, or feed part of their grain to their farm animals which replace the sock under the mattress as tangible savings. The Argentine government, which is the sole exporting agent for that country's grain, refuses to pay even a third as much for the grain they buy as they get for what they sell in Europe. So the Argentine farmer cuts his acreage too. We may berate such conduct as selfish—but we'd better not do it within the hearing of any American farmer!

Farm horses and other draft animals are being bred again in Europe; but colts must be given a couple of years before they can be broken to the plow. And since there isn't enough grain to feed the human population, not very much can be spared for these competing mouths.

### Slowly Recovering Factories

Tractors that might partly replace horses in front of the plows are not being built fast enough in Europe's slowly recovering factories: coal and steel are lacking, and undernourished factory workmen could not drive their machines at normal speed even if they had the raw materials.

Europe looks to America for farm implements as well as for tractors to pull them. We have sent many cargoes of this food-producing machinery and expect to increase these life-saving exports under the economic rehabilitation measures now pending. But the best we shall be able to do in 1948 will be only half enough to meet the stated needs of European lands.

The story of seed may be very briefly told: there simply isn't enough. We shall have to send considerable quantities. But no one, surely, will grudge this basic means of self-help.

The same story, with variations, might be told of the fourth great requirement of agriculture, fertilizers. In ordinary mixed commercial fertilizer three compounds bulk largest: phosphates, nitrates, potash. War has upset the fertilizer-cart, too, partly by cutting off sources, partly by interfering with transportation.

Nearest to normal is the phosphate situation. There are great phosphate-rock deposits in North Africa, which are being worked by the French; lesser sources on the Continent itself supplement this supply. But the whole European production is not enough; we shall have to supply some from our own none-too-well-stocked bins.

War's disruptive effects are felt most severely in the nitrate supply, for nitrates are materials for munitions as well as for fertilizers, and the great nitrogen-fixation plants of Germany were legitimate targets for the heaviest bombs that Allied planes could lug over them. Those that survived the bombings have not

been permitted to operate at more than a fraction of capacity, largely because of French fears of a resurgent German munitions industry. Our own fixation plants, geared mostly to war needs, adapt only slowly to peacetime production; though these are being put into use as fast as possible. The one great source of natural nitrate, the desert of northern Chile, is being worked for all it will yield; but there is a limit to the capacity of mining and handling machinery and to shipping space.

Potash presents Europe's greatest fertilizer anomaly. For many years the world's greatest source of potash has been a limited area near Stassfurt, in Saxony. We ourselves have been to a considerable extent dependent on German potash, although since World War I a sizable American industry in this mineral wealth has grown up. The postwar zoning of Germany has placed the Stassfurt potash mines under Soviet control. The Russians quite naturally have seen to it that their own needs are satisfied first, and are said to be demanding a rather high price for what potash they permit to move westward.

Even if, by some miracle or magic, all these dislocations in Europe's food-producing capacity could be immediately adjusted, Europe would still need food imports. Since the maturing of the industrial age, western Europe has always been an importer of food. Grain and meat have flowed to Britain, Germany, the Low Countries, Italy, from the United States, Canada, Australia, Argentina, South Africa. Industrial Germany has received grain from Russia and Poland, and from the latter country also pork—which of course is to a major extent grain on the hoof.

From this country and the members of the British Commonwealth the food-export stream is not only remaining normal but is being accelerated. Australia especially has had a great crop, and is looking hopefully towards another, as spring gets well under way in the Southern Hemisphere. Argentina's wheat-price policy is cutting into that country's sales: Argentine farmers, as already mentioned, are reluctant to produce for what they can get; European consumers make only distress purchases at the high price Argentina demands.

The 1947 wheat crop in the USSR is said to have been very large—how large, though, nobody but the Soviet officials know. It is known that they offered Britain a two-million-bushel grain deal—one million bushels of wheat and one million of corn and other feed grains. However, the British government could not agree to the price asked, and it was no sale. Since then, 350,000 bushels of Russian wheat has been consigned to Poland, which country in turn has been selling part of its potato surplus to American buyers for use in Germany and Austria. Poland expects to have exportable wheat of her own when the 1948 harvest comes in.

This is only a very sketchy outline of the European farm and food situation, with most of the details left out lest the story become simply interminable. It should be enough, however, to give an inkling what a complex and difficult situation faces our legislators, administrators and economists.

*Science News Letter, November 22, 1947*

***SHELL DETECTOR**—An electronic detector that will look like this apparatus will be used to find unexploded shells and metal fragments in trees being harvested at Fort Lewis, Washington.*

ELECTRONICS

# Metal Detector for Logs

**Hidden shells or metal fragments in trees can be located by new device so that the timber can be sawed into usable lumber.**

➤ HIDDEN metal shells or fragments in logs are to be located with an electronic device, a "metal detector", reports General Electric. In the process the logs will be floated through a magnetic field set up by the detector coil system.

The device was perfected for the U. S. Army, and is being used on the Fort Lewis Military Reservation in Washington state where there are some 3,700 acres of forest containing many trees which have hidden shells within them. No one seems to know where the shells came from, but the timber can not be sawed into usable lumber until the saw-destroying metal is removed. Some buried shells which had not exploded were found in logs, it is reported.

In use the device will be placed in water. When logs pass through the magnetic field set up by the detector coil system, an electronic circuit measures the amount of voltage unbalance in the field created by any metal in them. If the unbalance is great enough, both visual and audible alarms are affected, and workmen can mark the section of the log containing the metal.

*Science News Letter, November 22, 1947*

ENGINEERING

## Germs Removed from Water By Electric Precipitation

➤ WATER need no longer taste of chlorine to assure you of its safety, if the patent claims of G. P. Ham and Dr. R. B. Barnes, researchers for the American Cyanamid Company, are made good on a large scale. Their process, covered by newly-issued U. S. patents 2,428,328 and 2,428,329, gets the germs out of water by electrically precipitating them on sand or other granular dielectric material.

Typical setup consists of a cylindrical, rubber-lined tank containing a mass of sand separated into layers by thin mats of glass wool. Platinum electrodes, properly spaced, pass an electric current through the sand as the water filters through. The bacteria are not killed, but are found alive, adhering to sand grains in the uppermost layer. They may be destroyed in any manner desired, or saved alive for scientific use.

*Science News Letter, November 22, 1947*

ENGINEERING

## Lightning Arrester Gives Zig-Zag Ride to Ground

**See Front Cover**

➤ THE WORLD'S three largest lightning arresters, which zig-zag lightning harmlessly into the ground, are protecting costly laboratory equipment on the new 500,000-volt experimental transmission line put into operation by the American Gas and Electric Service Corporation in Brilliant, Ohio.

Engineers hope to learn economical methods of sending greater blocks of electricity from generating plants into the industrial and residential centers where it is needed with the aid of this mammoth outdoor laboratory.

"Greased skids" for lightning are the three 29-foot-high legs of the gigantic tripod—actually the world's largest lightning arrester—appearing on the cover of this week's SCIENCE NEWS LETTER. The large metal rings surrounding the apparatus equalize the electrical pressure, preventing one segment from becoming overloaded while others are idling.

*Science News Letter, November 22, 1947*

ASTRONOMY

## Bester's Comet Will Blaze In Heavens Early in 1948

➤ A COMET will blaze in the heavens early in 1948, giving an astronomical show in the sky that will remind old-timers of Halley's and other famous naked-eye comets.

At present the comet that astronomers hope will become prominently visible to unaided eyes is a faint blotch in the southern heavens. It was discovered late in September by M. J. Bester of the Harvard South African station.

Bester's comet, which you will be hearing much more about, is scheduled to move northward toward the Pole Star. Here it can easily be seen by observers in the United States and Canada.

Northern observers may possibly pick up the comet late in February, but the chances are slim that it will be spotted that soon. Although comet Bester will be brightest then, it will be so near the sun that it will probably be lost in the blaze of sunlight.

The comet will more probably be picked up early in March, calculates Dr. Leland E. Cunningham of Students' Observatory, University of California. Then it will have pulled farther away from the vicinity of the sun, toward which it is now speeding.

Moving rapidly northward, the bright comet will probably just suddenly appear. When found, it may rival in brilliance many of the well-known landmarks of the heavens. In brightness it may be between second and third magnitude (stars as faint as the sixth magnitude can be seen with the unaided eye), Dr. Cunningham estimates. This will make it an easy object to spot as it makes its way across the night sky.

This comet is only one of four bearing the name of Bester and now visible in the sky. One has the double name Rondanini-Bester as two people are credited with spotting it. Three of these comets were discovered this year, one last year. Right now they are all too faint to be seen without the aid of a good telescope.

Mr. Bester's find of last year is still easily visible with a good telescope, and is likely to remain so for several months more. His first comet of this year, the Rondanini-Bester comet, is now exceedingly faint, but will probably be followed by astronomers for another month or so. Mr. Bester's second comet of 1947 was followed until early August, at which time it was very faint. It is still in observing position and may be picked up again.

*Science News Letter, November 22, 1947*

ENGINEERING

## Wartime Landing Ships May Open Up New Waterways

➤ WORLD WAR II's ugliest ships, the awkward but important landing craft, may be used to open up commercial shipping in some of the world's undeveloped waterways.

This peacetime use for some of the surplus landing ships and craft left over from the war is proposed in the industrial bulletin of Arthur D. Little, Inc., Cambridge, Mass. LST's (Landing Ship, Tanks), LSM's (Landing Ship, Medium) and the other members of the Navy's wartime amphibious family could be used in such places as the Amazon River where they might open up new commerce.

Attempts to use the surplus ships in American waters have met stiff opposition from established transportation systems but in places where there are no docks and loading facilities for other ships, the landing ships might make new, peaceful commercial "invasions."

*Science News Letter, November 22, 1947*

# IN SCIEN

ASTRONOMY

## Sun's Life Is Limited to Ten Billion More Years

➤ THE sun will probably finish its life in about 10,000,000,000 years by becoming fainter and fainter until no longer able to support life on earth and other planets, Prof. George Gamow of George Washington University stated at the Cooper Union forum, in New York.

He based his prediction on the present rate of burning of the fuel supply in the sun. "The detailed study of possible reactions (in the sun)," he said, "leads to the conclusion that in the case of the sun, nuclear process represents the steady transformation of hydrogen into helium helped by catalytic action of carbon and nitrogen."

At the interior temperature of the sun, which is 20,000,000 degrees, only the comparatively light elements are subject to nuclear transformations. To get the energy from heavier elements, the temperatures of billions of degrees would be necessary.

"Most of the stars use the same energy-producing process, but do so at different rates," Prof. Gamow added. "Such brilliant stars as Sirius are apt to use up the hydrogen fuel much sooner, and are expected to collapse in a process resembling a terrific explosion."

*Science News Letter, November 22, 1947*

PHOTOGRAPHY

## Large Television Pictures Made with Correcting Lens

➤ THEATER-SIZE television pictures are now obtained by use of a large spherical mirror and a large correcting lens, Radio Corporation of America has revealed. The screen image may be 18 by 24 feet.

The new projector, yet in experimental stage, will be publicly demonstrated in the near future. It employs a 15-inch cathode-ray picture tube, a 42-inch spherical mirror, and a 36-inch aspherical correcting lens of the Schmidt type. The lens is said to be the largest Schmidt type system in the world except for the 72-inch Schmidt telescope on Mt. Wilson, Calif., which is not yet in operation.

*Science News Letter, November 22, 1947*

# NE FIELDS

GENERAL SCIENCE

## Psychiatrists Unprepared To Advise WHO or UNESCO

➤ PSYCHIATRISTS, social scientists, social workers and educators are unprepared to advise the World Health Organization and UNESCO, Dr. Harry Stack Sullivan of Washington, D. C., declared at the meeting of the National Committee for Mental Hygiene. He expressed doubt that many scientists are ready to generalize their work on a world scale or open their minds to scientific study of living where people have quite different standards.

World citizens who are not already outstanding community citizens will be few, Dr. Sullivan declared. Prime contribution to the coming of world citizenship is integration of communities and broadening them into greater communities of likeminded people of good will. WHO's constitution, which covers mental and social well being as well as prevention of disease, can be credited, Dr. Sullivan said, to the efforts in the preparatory meeting at Geneva of Dr. Brock Chisholm, Canadian psychiatrist who is now executive secretary of WHO's interim commission.

*Science News Letter, November 22, 1947*

GENERAL SCIENCE

## Nine States Enter Search For Youthful Scientists

➤ HIGH SCHOOL seniors in nine states will be getting two-for-one service when they enter the Seventh Annual Science Talent Search for the Westinghouse Science Scholarships this fall.

Boys and girls in nine states planning to be scientists will be entering a state competition when they comply with the rigid requirements of the national competition ending midnight, Dec. 26. (*See SNL,* Oct. 4). Cooperating states are Alabama, Georgia, Illinois, Iowa, Louisiana, Montana, Pennsylvania, Tennessee and Virginia.

Through a special arrangement with Science Clubs of America, administered by Science Service, which conducts the national Search annually, nine states will have state science talent searches concurrently with the national.

Budgets, ranging from a few hundred dollars to $9,000, have been set up by organizations of scientists, educators and industrialists to award scholarships or other financial assistance to talented high school students of science in their respective states.

Widespread interest on the part of State Academies of Science, educator groups and scientific industries makes possible the state science talent searches. The number of students honored in a state may range from three to 42 and the awards vary from small savings bonds to four-year scholarships in state schools of the winners choosing.

Persons in charge of state science talent searches are as follows:

Alabama: Dr. James L. Kassner, Sec., General Gorgas Scholarship Committee, P. O. Box H, University, Ala.

Georgia: Alvin L. McLendon, Jr., Chm. Jr. Acad. Com., Ga. Acad. of Science, Principal, Box 171 Statesboro High School, Statesboro, Ga.

Illinois: Dr. Lyell J. Thomas, Chm., Ill. State Science Talent Search, University of Illinois, Champaign, Ill.

Iowa: Dr. F. E. Brown, Chm., High School Relations Com. of Iowa Acad. of Science, Professor of Chemistry, Iowa State College, Ames, Iowa.

Louisiana: Bert B. Boyd, Dir., La. Jr. Acad. of Science, Science Dept., Northwestern State College, Natchitoches, La.

Montana: Adrien L. Hess, Dept. of Mathematics, Montana State College, Bozeman, Montana.

Pennsylvania: Sophia M. Moiles, Chm., Dept. of Physics, Johnstown Central High School, Johnstown, Pa.

Tennessee: Jacob H. Shapiro, Columbia High School, Columbia, Tenn.

Virginia: Dr. James W. Cole, Jr., Cobb Chemical Laboratory, University of Virginia, Charlottesville, Va.

*Science News Letter, November 22, 1947*

GEOLOGY

## Publicity Effort Blamed For New Volcano Report

➤ INVESTIGATION by an American geologist, Dr. Ivan Wilson, of the American embassy in Mexico City, has dashed hopes that a new volcano is being born in Mexico.

A few weeks ago, reports intimated that another Paricutin was appearing near Rio Blanco in Vera Cruz state, a region known to contain hot springs. Inspection showed no real volcano. The eruption report was publicity intended to attract tourists.

A veteran Mexican volcano scientist, Dr. Ezequiel Ordonez, called the phenomenon a fumarole, a hole from which gases or fumes issue.

*Science News Letter, November 22, 1947*

MEDICINE

## War Gas Chemical Used To Treat Skin Disease

➤ Nitrogen mustard, war gas chemical which has become one of medicine's new weapons against disease, has now been used with apparently good results in treatment of a rare but usually fatal skin disease.

The case is reported by Drs. O. S. Philpott, A. R. Woodburne and G. A. Waldriff, of the University of Colorado School of Medicine and Hospitals, in the *Journal of the American Medical Association* (Nov. 8).

The skin disease they treated is called mycosis fungoides. It is not, as its name might suggest, a fungus infection. Its cause is unknown. It is believed related to leukemia and Hodgkin's disease. Hard reddish tumors of the skin which tend to spread and ulcerate are its characteristic symptoms.

The patient reported by the Denver physicians was a 79-year-old man who had had the skin trouble for four years. He left the hospital against the doctors' advice and died several weeks later, so whether he would have been cured is not known.

The war gas chemical seemed "extremely effective," the doctors reported, in stopping the itching caused by the disease. The tumors rapidly disappeared, leaving the dark spots on the skin. The nitrogen mustard was given by injection into the patient's vein. Four doses, one each day, had been planned, but the fourth dose could not be given because the patient had nausea, loss of appetite and drop in blood platelets.

Somewhat smaller doses of nitrogen mustard, the doctors believe, might be safer and equally effective.

*Science News Letter, November 22, 1947*

WILD LIFE

## Tiny Beavers Thrown Away In Wide Search for Them

➤ FOUR tiny beavers, only five days old, were almost thrown away in a hunt for them by a motion picture enthusiast, T. J. Courtney of Halifax, Nova Scotia. Hidden in a ball of grass, the squeaks of the young led to their discovery.

The baby beavers, only five inches long and fully furred, were finally located in a mass of meadow grass which the guide removed from the beaver house during his search, Mr. Courtney states in the *Journal of Mammalogy.*

*Science News Letter, November 22, 1947*

NUTRITION

# Skeleton at the Feast

**A "thanksgiving" day dinner in Austria, Poland, or Germany, might be a bowl of potato soup. It might include a few leaves of cabbage.**

By SIR JOHN BOYD ORR
**Director-General, FAO of the U.N.**

*Told in an exclusive Science Service interview*

➤ THE generous people of America will be mindful of the needs of others when they come to their traditional turkey dinner on Thanksgiving Day. They will return hearty thanks for the fruits of the earth with which they have been so bountifully blessed, that they may share with those who are in want.

Never before in modern times has there been more desperate want in the world. In other lands, in Europe and Asia and in parts of Latin America and the Near East, few people will have turkey this year, or any festive equivalent of the Thanksgiving fowl of the United States.

Even in countries like England, where a poor man can still get a full meal, there will be no feast, for the best dinner possible for him is seldom anything but drab. If his diet does maintain health, it still lacks variety to support his spirits.

Millions of others must count themselves fortunate to have even enough to stave off starvation. Many will not be able to do even that.

### South of the Border

In some of the countries of the Western Hemisphere, in Mexico and Guatemala for example, many people might have festive turkey on their tables, though of course they do not celebrate Thanksgiving Day, a national holiday of the United States of America. But the turkey has been a favorite festive fowl in Central and South America for many centuries. And though living standards in some countries of this region have never been high, shortages this year are not so great as elsewhere in the world.

The turkey went to the Middle East to get its western name. There it is highly favored for a feast; but few will be able to afford this food in the Middle East this year. While supplies of food are not as scarce in that region as in many others, inflation ranging from 200% to 1,000% above prewar years makes it very difficult for the majority of the people to secure even the necessities of life.

Farther to the East, in India, more than half the people are rice eaters. A feast would be boiled rice, mixed with vegetables and some meat cooked with spices. In better times a poor man might afford such a feast, together with some sweets, once or twice a year. But rice production is only 92% of the prewar level and the population has increased by many millions. Plain rice, and too little to go around, will be the season's fare of the overwhelming majority of the rice eaters of India.

### India's Wheat Crop

In other parts of India the people are wheat eaters. The partial failure of the wheat crop and the abandonment of fields of wheat at the harvest season in the Punjab during the period of civil strife last summer will aggravate hunger among the population there and elsewhere in India.

As in India, the people of China are divided among rice eaters and wheat eaters. China is short of food and a serious famine occurred there last year. In the South of China there are shortages of fertilizers, seeds, and farm animals. Many people are too weak from under-nutrition to work. In the North of China the wheat crop this year was cut 60% by the spring drought. All over China communications have been disrupted by years of war and civil unrest. There will be scarcely any feasts among the masses of people of China this year.

As serious a food crisis exists in some countries of Europe as in Asia. Last year in nine European countries, representing one-half of the population of the continent, less than 2200 calories daily per person were available. Nutrition experts have defined as "emergency subsistence" a national average supply level of 2200 calories. This is the minimum needed to prevent serious under-nutrition leading to disease and the danger of civil unrest.

A low average in a country means semi-starvation for some groups and adverse effect on health generally. The prolonged food crisis in both Europe and Asia has retarded the growth of young people, lowered body weights, and increased the death rate, especially among children. It has impaired the capacity for work and increased the incidence of tuberculosis and deficiency diseases. In some regions of Europe tuberculosis has reached the epidemic stage.

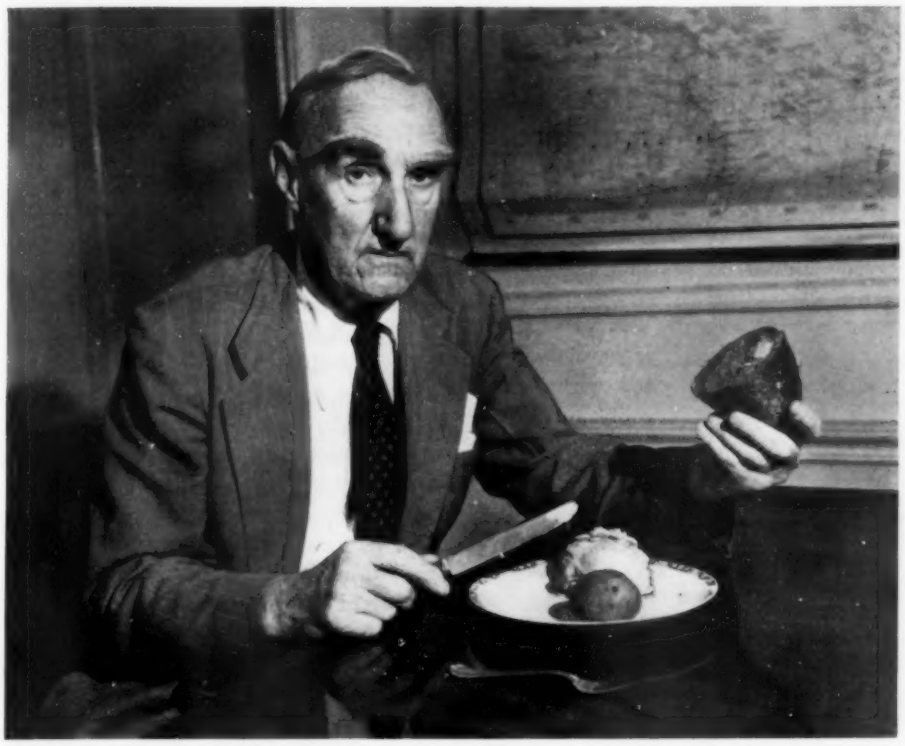
### Food Rationing in Austria

The modest goal of the government of Austria last summer was to have stocks of food at least four weeks ahead. Then the government could plan for good distribution to settle unrest among the people. The people realized that they could not have any more food than the ration stipulated. They only wanted to be sure that this meager ration would be honored. Normal consumption was 1550 calories, of which 1,000 came from bread. Beans and sauerkraut sometimes had to be put on the ration for babies because there was nothing else to give.

A "thanksgiving" day dinner in Austria, Poland, or Germany, might be a bowl of potato soup. It might include a few leaves of cabbage.

An FAO nutritionist wrote of con-

***FOR AMERICAN THANKSGIVING—Mindful of the misery abroad, we have much to be grateful for when we sit down to our traditional turkey dinner on Thanksgiving Day.***



*EUROPE'S MEAGER FARE—Sir John Boyd Orr is shown eating bread with a little margarine, some cabbage and potato, illustrating the desperate want that will stalk millions abroad while we feast.*

ditions she observed in Italy last summer. The government calculated that the food supply in the country would provide a daily allowance of 2,076 calories per person daily. Since the partial failure of the European harvest last summer, the estimate must now be revised downward. The tuberculosis rate in Italy has risen to almost double the 1940 rate and is of the most serious concern to the government.

### What Italians Are Eating

An Italian's ordinary dinner is spaghetti with sauce. His daily allowance of fats and oils is less than a tablespoon, and of sugar one teaspoon. He will have vegetables and fruit in season and a tiny piece of cheese when it is available. Such would be a "thanksgiving" dinner in Italy.

In Scotland, my native land, one may have a shilling's (20 cents') worth of meat a week. A family of three could manage a two-pound roast for Sunday dinner by doing without meat the rest of the week. Food rationing in the United Kingdom is austere but it is democratic. Food supplies are distributed fairly among all the people. Supplies of food available in the United Kingdom in 1946-47 were sufficient to maintain an average calorie level of 2,880 per person daily. The average level in the United States was 3,392.

But comparisons of numbers of calories available to people tell only part of the story of the difference between the diet in America and in the deficit countries. Suppose, instead, we compare available supplies of meat and poultry, eggs and milk.

In the United States, supplies available for consumption in 1946-47 were sufficient to provide each member of the population with two average-sized servings of meat and poultry, one egg and three glasses of milk daily.

### Amount For Consumption

This quantity of meat and poultry was the amount available for two days' ration in France, four in Britain, 6½ in Italy, and 14 in Poland and Austria. In Poland and Austria three glasses of milk had to last four days and available supplies of eggs were only sufficient to provide one per person every fortnight. This quantity of milk and the egg would have been the average supply available for the ration of these products for six days in Italy and three days in France. The United Kingdom was able to supply an egg to each person every other day and three glasses of milk for 11/3 days.

Cereals constituted 52% of the average European diet in 1946-47, and as much as 62% in countries where the calorie supply was low. In the United States cereals formed only 25% of the diet. Some of the people in a few of the countries of Europe have had practically no animal food since the war.

Owing to partial failure in the 1947 harvest the people in the deficit areas of Europe this year face the threat of even lower rations than any time since the war. Nor will the food shortage end in 1948. It will continue for many years. But it can be overcome, provided the nations will act together on a unified plan. The solutions are to be found in more production and more equitable distribution of food, together with a general improvement in the economic life of the people of the whole world.

Then and only then may a Thanksgiving Day for the world be proclaimed.

*Science News Letter, November 22, 1947*

*Milk* is desirable for elderly persons to help prevent bone breakage.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# New Use for Laughing Gas

**Mental patients are now being helped by its calming effect. With this treatment the patient gains insight into his trouble through conscious mental processes.**

➤ THE use of "laughing gas" to calm excited mental patients and even to help some toward partial recovery from their illness is reported by Drs. H. Lehmann and C. Bos of Montreal in the *American Journal of Psychiatry*, (Sept.).

The gas used is nitrous oxide, which many persons know from taking it when a tooth is pulled. The Montreal doctors give enough of it to the mental patients to get them past the "slap-happy" stage but not to produce a serious degree of oxygen lack.

The treatment is safe, they find. It lasts about two to four minutes. After it the patient wakes up in a much better mood for talking to the doctors and discussing his problems.

This phase of "mental facilitation" was unexpected. It is this which is apparently responsible for the treatment helping the patient toward some degree of recovery, since it makes the patient better able to gain insight into his trouble and accept psychiatric treatment.

But even apart from this, the treatment helps by calming the patients. The calming effect lasts for several hours, and patients get a good night's sleep after the treatment. It was this calming effect on excited patients for which the doctors first used the treament.

Some patients are given the treatment as many as four times a day, though for many one treatment a day is enough.

The "laughing gas" treatment is something like electric shock treatment, the doctors believe, but is less severe, safer and easier to give. It differs somewhat also from another modern psychiatric treatment called narcoanalysis. In this narcoanalysis, drugs are given to put the patient to sleep or in a hypnotic state which makes it possible for him to remember and talk about repressed feelings and experiences. With narcoanalysis, the doctors can get at unconscious factors in the patient's mental illness. With the "laughing gas" treatment, the patient gains insight into his trouble through conscious mental processes.

The doctors are now studying the effects of this gas treatment in patients in the early stages of manic-depressive illness who have not yet had a complete mental breakdown. The speed and ease with which the treatment promotes mental activity and the feeling of well-being and increased confidence it gives may, they think, be valuable at certain stages of psychiatric treatment.

The treatment may be given to patients in the doctor's office without interrupting their ordinary activities.

*Science News Letter, November 22, 1947*

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METEOROLOGY

# Greenland Essential Now

➤ AMERICAN weather, radio and airport stations on Greenland, which played an important part in the recent war, are now essential for the peacetime navigation by air or water from the United States to European ports by way of the Great Circle route.

It is the short route to much of Europe. Planes from New York to West Europe pass over Newfoundland, then south of Greenland. Ocean liners follow a parallel route, particularly during the non-iceberg season. Both, on the eastern half of their trip, are subjected to weather bred in Greenland. In fact, all western Europe is affected by Greenland-bred weather.

Greenland is a Danish possession. By treaty with Denmark these essential stations can remain indefinitely under peacetime conditions. Some believe that Greenland should be purchased from its present owner and become property of the United States. The stations would then be secure. Russia is said to object to the American operation of such stations either under treaty or ownership of the island. Hitler objected to them during the war. Weather reports from them assisted the Allied Armies in their invasion of France and Germany. They also were of great help to the American convoys which carried food and war equipment to the Red Armies by way of Iceland and northern Russian Arctic ports.

Greenland is the largest island in the world, not counting the Australian continent. It is estimated to contain 736,518 square miles of territory, about one-fourth that of the continental United States. But most of Greenland is covered with ice; only about 31,000 square miles, along the southeast and southwest coastlines and south of the Arctic Circle, is free of ice and suitable for settlement. It is along these coasts that most of Greenland's 21,000 people live. Practically 20,000 of these are native Greenlanders.

Economically, Greenland is not important. It produces a few vegetables for home consumption. It has a few cattle, but is growing in importance as a sheep-raising country. It exports considerable cured fish and some whale and seal oil. It has some coal and iron. Its most valuable mineral is cryolite, a mineral found only there and used in the United States in the manufacture of aluminum by the electrolytic process.

*Science News Letter, November 22, 1947*

# CHRISTMAS SHOPPING

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# Books of the Week

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CHILDREN OF THE PEOPLE—Dorothea Leighton and Clyde Kluckhohn—*Harvard Univ. Press,* 277 p., illus., $4.50. This comprehensive study of Navaho personality and psychology, with its detailed consideration of the manner in which "The People" bring up their children, should be of interest to anthropologists, teachers, psychiatrists, psychologists and educators. It is a joint project of the University of Chicago and the U. S. Office of Indian Affairs.

HEARING AIDS: An Experimental Study of Design Objectives—Hallowell Davis, et al.—*Harvard Univ. Press,* 197 p., paper, $2.00. Initiated under contract between the Office of Scientific Research and Development and Harvard University, this survey describes the experiments, tests and results upon which an ideal master hearing aid for the majority of deaf should be based.

HIGHWAY RESEARCH BOARD: Proceedings of the Twenty-Sixth Annual Meeting—Roy W. Crum, Fred Burggraf, and William N. Carey, Jr.—*Div. of Engring and Ind. Res., Nat. Res. Counc.,* 618 p., illus., $7.50 Report includes papers on economics, finance and administration; design; materials and construction; maintenance; traffic and operations; and soils investigation.

THE LIFE AND WORK OF COPERNICUS THE ASTRONOMER — Angus Armitage—*Schuman.* This book has been chosen as the first of the fall series of Science Service Book Selections. See page 336 for further details.

NATIONAL PAINT DICTIONARY—Jeffrey R. Stewart—*Stewart Research Laboratory,* 3rd ed., 704 p., illus., $7.50. Detailed definitions, with illustrations, which should be helpful to the paint technologist or the student.

OUR CHILDREN ARE CHEATED—Benjamin Fine—*Holt,* 244 p., $3.00. The author presents the results of a nation-wide survey of educational standards in the public school systems, analyzes the problems which constitute a crisis in education, and assesses the importance of this crisis to a democratic society.

PSYCHIATRY FOR EVERYMAN—J. A. C. Brown—*Philosophical Lib.,* 247 p., $3.00. Intended for popular use, this book is a well-written history of psychiatry, including exposition of the theories of Freud, Jung, Adler, and others, as well as some discussion of psychiatric techniques.

REFERENCE BOOKS: A Brief Guide for Students and Other Users of the Library—Mary Neill Barton—*Enoch Pratt Free Library,* 94 p., illus., paper, 80 cents. A convenient handbook of suggestions to the library user on how to utilize a number of the more popular reference materials.

*Science News Letter, November 22, 1947*

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NUCLEAR PHYSICS

# Soviet Atom-Bomb Test?

➤ ONLY really likely detail in the Armistice Day report of a Soviet atom-bomb test is the locale—Irkutsk. This Siberian city, near the southern end of Lake Baikal, is in the midst of wild inaccessible country that would be just about as good as our own New Mexico desert for the technical purposes of a major explosion test. It would be even better from a security viewpoint, for there is hardly a place in the world that unauthorized visitors would find it harder to reach. The area for hundreds of miles around is completely under the control of the USSR, and transportation, except over the Trans-Siberian Railway, is limited to caravan routes over the Mongolian deserts and through the mountains.

For the rest, the whole business looks like either a deliberately "planted" story timed for maximum political effect, to offset the convening of the special session of Congress in this country, or (more likely) the kind of "think-piece" that used to be cooked up by frustrated newspapermen in such wartime rumor factories as Stockholm and Zurich.

The 13-pound weight given for the bomb would be correct only if the critical mass of the U-235 or plutonium used were near the minimum of four and two-fifths pounds first suggested in the Smyth report. Something must be allowed for the weight of the bomb casing—and 13 pounds is just about the weight of a common 75-millimeter shell.

A later, more closely calculated critical weight, from a high British scientific source, puts the minimum between 22 and 66 pounds. This is too high for the reported Soviet bomb.

The 21-mile distance at which the explosion could be heard sounds a lot more like the audible range for a very ordinary missile such as a 1000-pound bomb or a 16-inch naval shell. The Able-day burst at Bikini was a loud though somewhat dull roar at the 19-mile distance at which the observation ships were stationed; had there been anyone at a hundred-mile distance he probably would still have heard it. The first American test, in the Southwestern desert, was reported to be audible 200 miles away.

Nothing is said in the news story by the unidentifiable "John Griggs" about the brighter-than-daylight flash and the fast-climbing incandescent cloud which have been most outstanding features of all four air-bursts of atom bombs thus far authentically reported.

Detection at a distance of any atom-bomb explosion is most likely through very sensitive instruments that record fluctuations in the number of electrically charged particles in the atmosphere. If American scientists with our armed forces have such instruments set on mountain-tops in Japan or the Aleutians they may possibly have picked up invisible but still radiologically active wisps of an atom bomb as far off as Lake Baikal. Detection by instruments of known types on the American mainland is quite improbable. Claims of such detection after the first Bikini explosion are now regarded somewhat skeptically by most American physicists. Of course, if American observers did pick up something in Japan or the Aleutians, the records are not likely to be made public.

The Serge Vavilov who is reported to be heading Soviet atomic research apparently is the same as S. I. Vavilov, who has been president of the Academy of Sciences of the USSR since July, 1946. The Very Rev. Hewlett Johnson, "Red Dean" of Canterbury, in a new book on Soviet Russia, quotes him as promising, in his inaugural address, that "Special attention will be paid to atomic energy and cosmic rays."

*Science News Letter, November 22, 1947*

GEOPHYSICS

## Radar of Little Value in Finding Mineral Deposits

➤ IN spite of popular belief, radar probably will be of little value in locating hidden minerals in the crust of the earth, the American Mining Congress meeting in El Paso, Texas, was told by Dr. Henry R. Joesting of the U. S. Geological Survey. Microwaves have practically no depth penetration, he said.

Plane-borne radar could be used for rapid mapping of rock outcrops and of variations in soil and vegetation, which are often indicative of deeper-seated conditions. But comparable information can be obtained more simply and more cheaply by ground observation and aerial photographs.

Dr. Joesting described the instruments used by geophysicists in locating underground minerals, and predicted new electrical devices. Geophysics plays a major part in petroleum exploration, he declared, but for other minerals it has not been a spectacular success in this country. The petroleum industry spends annually more than $50,000,000 in the United States on geophysical exploration and on research in geophysical methods. The amount spent for the same purpose by other mining enterprises is relatively insignificant.

Geophysical exploration techniques have benefited from recent developments in electronics, metallurgy, chemistry and in almost all fields of physical science, but it is doubtful if any entirely new techniques will result from these developments, nor is it likely that basic principles will be radically changed. Lighter, more powerful equipment will result, equipment that will use automatic recording and computing instruments.

The war-developed magnetometer is finding practical application in mineral surveys, he stated. The air-borne instrument, flown over great areas trailing a plane, has a ground version that is used in a car-towed trailer. The helicopter is also being used for detailed magnetic surveys.

An electric method, that offers future promise, involves the induction of current in the ground by a primary alternating current flowing through an insulated coil; and the measurement of the resulting electromagnetic field at the surface by means of a second coil and an amplifier. The method has been little used in America, but is in use in Sweden, Finland and Russia.

*Science News Letter, November 22, 1947*

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*ASH TRAY, flower and candle holder in combination, is an elongated tray with a grill cover which has a round hole in its center to support a candle. The stems of flowers are stuck through the rectangular openings in the cover into perforations in a platform below.*

*Science News Letter, November 22, 1947*

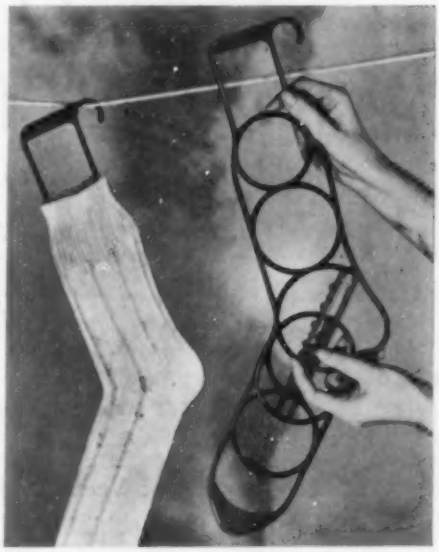
*STAPLES for low-voltage household electric wiring are held together in strips of ten by an insulating material which fits on the inside of their U-ends. When one staple is driven, the remaining strip with its staples is easily separated by means of perforations in the insulation.*

*Science News Letter, November 22, 1947*

*ELECTRIC HEATER and battery charger in combination, recently patented, has an electric resistance heating element with terminals to connect to a commercial alternating power line, and also a transformer to change the alternating current to direct current of the proper voltage for battery charging.*

*Science News Letter, November 22, 1947*

*SOCK-STRETCHER, particularly to prevent shrinkage of wool socks when drying, is made of a flexible plastic frame, shown in the picture, and has an adjustable foot which can be extended from size 9 to size 13. The adjustment is made with a thumb knob.*



*Science News Letter, November 22, 1947*

*CHEMICAL COATINGS for artificial fish lures, such as flies, spinners, and miniature crawfish or frogs of rubber that are drawn along the water's surface, have a distinctive odor for the lure on which used. Some fish are guided by smell; the value of these scented lures is now under test.*

*Science News Letter, November 22, 1947*

*BOW-PIN, for curling hair, is a flattish metal strip used in combination with a plastic tube and an ordinary hairpin. The bow-pin, with ends close together, is inserted into the tube with the hairpin outside through its loop. When the hair is wound around the tube and the tube pulled out, the bow-pin snaps down to hold the curl in place.*

*Science News Letter, November 22, 1947*

*LAMP TO KILL GERMS in the air by indirect radiation, and molds and fungi on surfaces or in liquids by direct radiation, will find uses in homes and schools to destroy airborne bacteria, and wide uses in food-processing plants and other places to destroy contaminating germs and fungi.*

*Science News Letter, November 22, 1947*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## Question Box

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*Photographs: Cover, Westinghouse; p. 323, left, Chemical and Engineering News; p. 325, Navy; p. 327, General Electric Co.; p. 330 and 331, Fremont Davis.*

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